



## Framing Rectangles Grade 1-2

### Introduction

In this activity students get creative with making rectangles out of square tiles. This activity makes space for our young mathematicians to count, describe shapes, explore ideas, build with square tiles, investigate conjectures, organize findings, add and takeaway square tiles, and record ideas with visuals.

### Agenda

Activity	Time	Description	Materials
Mindset Message	5 min	Play the mindset video	Mindset Video
Square tiles playtime	10-15 min	<ol style="list-style-type: none"> <li>1. Play time with the manipulative</li> <li>2. Put up an image of a rectangle and ask if anyone built this shape. Tell them this is the shape we will study today.</li> <li>3. Have students walk about the room to see if anyone built a rectangle, emphasizing how we observe and learn.</li> </ol>	Square paper tiles, Framing Rectangles Handouts attached, or a square tile manipulative
Framing Rectangles	45 min	<ol style="list-style-type: none"> <li>1. Create as many rectangles as you can with up to 12 square tiles in each rectangle. Draw each of your rectangles on grid paper.</li> <li>2. What if you put a different color border of tiles around each rectangle? How many tiles are in your border for each of your different rectangles? Draw each of your rectangles on grid paper</li> </ol>	<ul style="list-style-type: none"> <li>• Square paper tiles, Framing Rectangles Handout attached, or a square tile manipulative</li> <li>• Poster paper (optional)</li> <li>• Glue (optional)</li> </ul>
Debrief Mindset Message	5 min	Debrief the mindset messages for this activity.	



### Activity

Set students up to work with a partner, give the square tiles out giving students time to play with them before you start the activity. After some time to build, invite a couple of volunteers to share what they have created. Ask if any students made a rectangle, invite volunteers to share the rectangle they made. If you have a document camera you might consider building the rectangles as students describe them or have students build their own rectangles. Use this as a chance to clarify what a rectangle is. You might consider whether or not to include squares as possible rectangles or not.

Next have each student count out 12 of the same color square tiles and move the other square tiles to the side or back in the container. Set up students to explore making rectangles using up to 12 square tiles. Share with students that their first challenge with rectangles for the day is to create as many rectangles as you can with up to 12 square tiles. Ask them to record each rectangle on grid paper. You might also make gluing square tiles together on paper as a way to capture all the rectangles they come up with.

As students explore, encourage them to be creative about the rectangles they make. If you notice they are making rectangles with dimensions  $1 \times 2$ ,  $1 \times 3$ ,  $1 \times 4$ , and so on, you might consider having them share the rectangles they made with each other. If pairs have the same rectangles at a table you could tell pairs about rectangles you've seen at other tables. By giving an example of other rectangle possibilities while they explore students can think more openly about the rectangles they are making moving forward.

After the first challenge you might bring together the class and have pairs share some of the rectangles they created. You could start by asking the class how many rectangles they created and record the different numbers students give (show excitement when this happens!), then invite students to share the different rectangles they created. Draw the different rectangles and label the dimensions so the class can see all the ways their class created rectangles.

Move pairs on to the second challenge, have them take out some different colored tiles and tell them about the challenge: What if you put a different color border of tiles around each rectangle? How many tiles are in your border for each of your different rectangles? Record this by adding to your rectangles from the first challenge or drawing a new rectangle with borders on grid paper.

Give pairs time to make borders around each of their rectangles. Encourage them to build them before putting them on paper, you might consider giving out more square tiles for this part of the activity and suggesting that pairs share as they need to.



Once pairs have had time to make borders and record their findings, bring the class together for a closing conversation. Make a table and have students share their findings. You might prepare this table while pairs are exploring. Once you've recorded their findings, invite students to share findings that might be different, patterns in the number of square tiles, and questions.

### Extensions

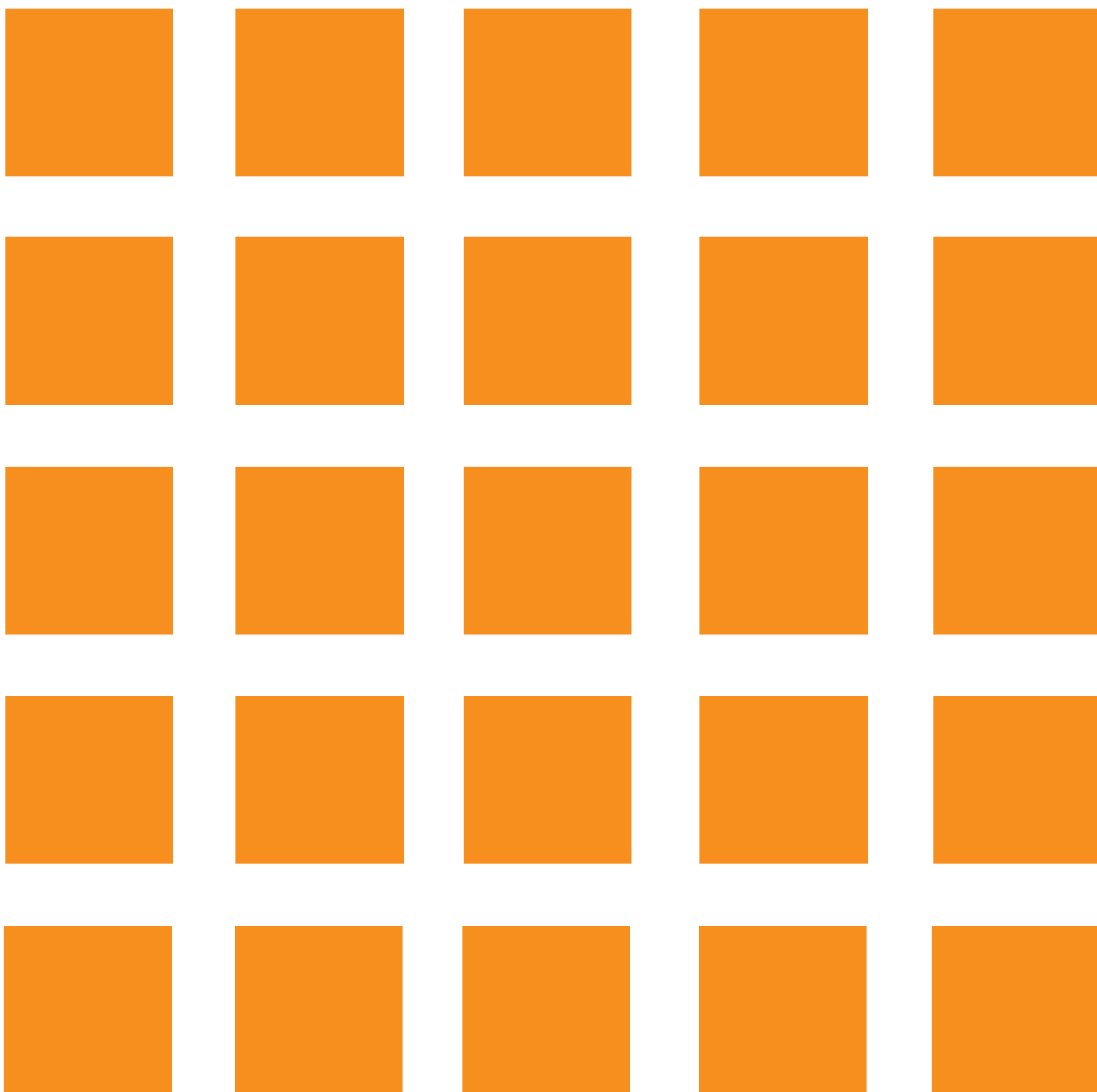
- What does the border of a rectangle with dimensions 4 square tiles by 3 square tiles look like?
- If you have a border with 14 square tiles, what could be the dimensions of the rectangle? Is there only one rectangle with a border of 14 square tiles?
- Is there a rectangle with a border that uses the same number of square tiles? What does it look like? Can you find any others?

### Materials

- Square paper tiles (Framing Rectangles Handouts) or Square tile manipulatives
- Poster paper (optional)
- Glue (optional)



# Framing Rectangles Handout





# Framing Rectangles

## Handout

